# AGRO

## DIVISION OF AGROCHEMICALS

C. Cleveland, *Program Chair*

### SUNDAY MORNING

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

**New Herbicides & Their Modes of Action**

Financially supported by Corteva Agriscience and FMC Corporation
F. Dayan, *Organizer*
S. O. Duke, T. M. Stevenson, *Organizers, Presiding*

**8:40** Introductory Remarks.

**8:45** Explorations into the development of new herbicides and modes of action. **K. STUBBS**

**9:10** Tetflupyrolimet: New mode-of-action herbicide that interferes with pyrimidine biosynthesis. **K.A. Hughes**, T.P. Selby, A.D. Satterfield, A. Puri, D.A. Travis, M.J. Campbell, A.E. Taggi

**9:35** Inhibition of a step in plant *de novo* pyrimidine biosynthesis by a new class of herbicide causes selective phytotoxicity with commercial levels of activity. **I. Kang**, J.L. Andreassi, S. Gutteridge

**10:00** Intermission.

**10:20** Novel herbicidal agents based on a substituted pyrazole core with an unknown mode of action. **S. Lehr**, **H. Helmke**, **J. Tiebes**, U. Doeller, **C. Kallus**, T. Mueller, **B. Kuhn**

**10:45** Discovery of cyclopyrimorate, new mode of action herbicide in paddy rice fields. **T. Hamada**, M. Shino, Y. Shigematsu, K. Hirase, S. Banba, Y. Tsukamoto, J. Kadotani

**11:10** Benzoxaboroles as starting points for new herbicides. **J. Roth**, J. Gruber, D. Riar, K. Bravo-Altamirano

**11:35** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**Breaking Chemistry Barriers to Feed the World**

L. Rossi, *Organizer*
H. B. Irrig, C. Tiu, *Organizers, Presiding*

**8:15** Introductory Remarks.

**8:20** EPA's role in ensuring a safe food supply. **R. Keigwin**, M. Goodis

**8:45** Global challenges in trade policy: Pesticide MRLs. **L. LaPointe**, R. Vanderberg

**9:10** Chemical registrant perspective on challenges to breaking barriers to feed the world. **C. Smith**

**9:35** Import pesticide tolerance pilot project. **L. Rossi**

**10:00** Intermission.

**10:20** Importance and consequences of MRL disharmony in the trade of almonds. **G. Ludwig**, J. Adam, J. Roseman, G. Bogart

**10:45** USA potato challenges regarding MRL's of different countries. **D. Robinson**

**11:10** Navigating World Trade Organization activities to promote science-based trade. **A. Markitanova**

**11:35** Panel Discussion.

**11:55** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**CRISPR/Gene Editing & RNAi: Utilization for Enhanced Crop Production**

Cosponsored by AGFD and BIOL
P. Reibach, M. C. Ruebelt, *Organizers, Presiding*

**8:40** Introductory Remarks.

**8:45** Development of Cibus' Trait Machine™ to efficiently apply gene editing. **D. Songstad**

**9:10** Transient expression of CRISPR-Cas systems to mature plant tissues with nanoparticle-mediated delivery. **F. Cunningham**, G.S. Demirer, S. Jeong, J. Wang, N. Goh, A.J. Aditham, M. Landry

**9:35** Rise of new CRISPR technologies and their potential to reverse the loss of nutritional and health benefits in the modern food system, caused by decades of intensive breeding. **M. Oufattole**

**10:00** Intermission.

**10:20** Antiviral siRNA nanoparticles protect shrimp against white spot disease. **A. Schroeder**

**10:45** DNA nanostructures coordinate gene silencing in mature plants. **H. Zhang**, G.S. Demirer, H. Zhang, N. Goh, A.J. Aditham, F. Cunningham, M. Landry

**11:10** Journey of effectively and efficiently developing a formulated dsRNA product. **L. Aulisa**

**11:35** EPA registration of dsRNAi plant incorporated protectants: Implications for genome edited products. **K. Matthews**

**12:00** Concluding Remarks.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**Creative Thinking in Designing Efate Studies & Data Analysis to Meet Agrochemical Regulatory Challenges**

Cosponsored by ENVR
C. Fang, *Organizer*
A. K. Sharma, M. Zhang, *Organizers, Presiding*
C. Fang, *Presiding*

**8:40** Introductory Remarks.

**8:45** Comparing hot versus cold metabolism studies. **C. Seigneur**

**9:10** Derivation of soil aged sorption parameters of pesticides from field dissipation studies: Theoretical considerations. **X. Huang**

**9:35** Separation of highly polar photolytic degradation products of benzophenone pesticide. **D. Safarpour**

**10:00** Intermission.

**10:20** Development of plant uptake factor study for regulatory environmental fate modeling. **X. Zhou**, C. Schriever, M. Lamshoeft, H. Reseler, R. Sur, P. Volz

**10:45** Test design modifications to assess the transformation of chemical compounds in aquatic sediment (OECD 308) and soil (OECD 307) test systems: Simulated natural sunlight, algae, pesticide mixtures. **C. Wijntjes**, Y. Weber, D. Adam, W. Völkel, A. Schäffer

**11:10** Modifications to laboratory based surface water mineralisation tests to investigate persistence. **C. Lowrie**

**11:35** Biphasic sorption and transformation are key factors in the environmental fate of the herbicide monosodium methylarsenate. **S.Z. Cohen**, M. Williams, M. Eldan, Y. Masue-Slowey, P. Miner, J. Cheplick, C. Hoogeweg

**12:00** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Plant-Insect-Microbe Communications in Agriculture: Early Career Scientist Symposium**

P. Kendra, J. Niogret, N. Tabanca, *Organizers, Presiding*

**8:15** Introductory Remarks.

**8:20** Communication between ambrosia beetles, host trees, and humans: What we know and what we don't know. **c. werle**, K. Addesso, J. Oliver, C. Ranger, M. Reding, B. Sampson, P. Schultz

**8:45** Development of a push-pull system for the redbay ambrosia beetle *Xyleborus glabratus*, vector of the laurel wilt pathogen. **X. Martini**, L. Stelinski

**9:10** Semiochemicals in context: How status of target interactions for behavioral manipulation influences application. **M.J. Rivera**

**9:35** Chemical ecology of host and vector manipulation by plant viruses. **K.E. Mauck**, Q. Chesnais, J. Kenney

**10:00** Intermission.

**10:20** Microbial metabolites mediate bumble bee attraction and feeding. **R. Schaeffer**, C.C. Rering, I. Maalouf, J.J. Beck, R.L. Vannette

**10:45** Belowground semiochemicals mediating multi-trophic cascades. **D. Willett**, H.T. Alborn, L. Stelinski

**11:10** Plant chemical responses to herbivory by the imported cabbageworm and two parasitic wasps. **R. Paul**, F.E. Dayan, D. Vyas, P. Ode

**11:35** Characterisation of the volatile chemical signalling from the beneficial soil fungus *Trichoderma hamatum*. **G. Thomas**, M. Birkett, J. Pickett, M. Grant, D. Withall, J. Sidda, J. Vuts, C. Thornton

**12:00** Concluding Remarks.

<section>

**Chemistry & Utilization of Agro-Based Materials**

**Session 1. Water in Chemistry and Agriculture**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Metals & Trace Elements in Food Safety, Health & Food Quality**

**Metals and Trace Elements in Food Safety & Toxicology**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Chemistry of Water Reuse Processes Toward Water Sustainability**

Sponsored by ENVR, Cosponsored by AGRO and PRES

**SUNDAY AFTERNOON**

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

**New Herbicides & Their Modes of Action**

Financially supported by Corteva Agriscience and FMC Corporation
F. Dayan, S. O. Duke, T. M. Stevenson, *Organizers, Presiding*

**1:00** Introductory Remarks.

**1:05** Discovery of new herbicide modes of action by quantification of plant primary metabolite and enzyme pools. **S.O. Duke**, F.E. Dayan

**1:30** Reactive oxygen species trigger the fast action of glufosinate. H. Takano, R.S. Beffa, C. Preston, P. Westra, **F.E. Dayan**

**1:55** Competitors, non-competitors, and un-competitors in herbicide sites of action. **R. Sammons**

**2:20** Resistance-gene directed discovery of a natural product herbicide with a nw mode of action. **Y. Tang**, S. Jacobsen

**2:45** Intermission .

**3:05** Splicing inhibition is responsible for spliceostatin C phytotoxicity. **J.N. Bajsa-Hirschel**, L. Boddy, M. Sabat, Z. Pan, S.O. Duke

**3:30** Unusual sugar from cyanobacteria acts as natural inhibitor of the shikimate pathway. **K. Brilisauer**, J. Rapp, P. Rath, S. Grond, K. Forchhammer

**3:55** What if field resistance was identified prior to herbicide commercialization? Case study with cinmethylin resistance in annual ryegrass (*Lolium rigidum*). **R. Busi**, **F.E. Dayan**, H. Beckie

**4:20** Discussion.

**4:40** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**Breaking Chemistry Barriers to Feed the World**

C. Tiu, *Organizer*
H. B. Irrig, L. Rossi, *Organizers, Presiding*

**1:00** Introductory Remarks.

**1:05** Crop grouping and other tools to enable trade of specialty crops. **J.j. Baron**, D. Kunkel, M.P. Braverman, W. Barney

**1:30** Update on international industry MRL coalition work. **G. Kurbis**, E. Bergeron

**1:55** Risk, hazard, human health, and international standards setting for pesticide and veterinary drug maximum residue levels. **B. Bryant**

**2:20** Research needs in the emerging synthetic meat industry. **M.P. Campos**

**2:45** Intermission.

**3:05** Global harmonization of MRLs: New threads, old threads, lost threads. **M. Sharpe**

**3:30** Urea cocrystal design for improved agrochemical nitrogen management. **J. Baltrusaitis**, M. Silva, D. Kiani

**3:55** ONE MRL concept. **C. Tiu**

**4:20** Communicating science to an audience that no longer understands what we are trying to say. **G. O'Sullivan**

**4:45** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**Agrochemical Residue & Metabolism Chemistry**

Cosponsored by AGFD
J. J. Johnston, K. Mastovska, D. J. Smith, X. Zhou, *Organizers, Presiding*

**1:00** Introductory Remarks.

**1:05** Chromatographic separations of several functional analogs. H. Kandala, **T. Chowdhury**

**1:30** Evolution of the multi-residue method: Epic quest to perfect the pesticide residue analytical method. **S. Perez**, J. Adams

**1:55** Multi-residue pesticides analysis in hemp using GC and LC tandem mass spectrometry. **J. Lee**, J.J. Doherty, S. Safie, N. Aldrich, J.M. Clark

**2:20** Trials and tribulations of glyphosate analysis in raw agricultural commodities, foods, and dietary supplements. **J.P. Zulkoski**, S. Avula, L. Vaclavik, K. Mastovska

**2:45** Intermission.

**3:05** Fate and distribution of $^{36}$Cl-chlorine dioxide gas on animal and plant-based foods. **D.J. Smith**, A. Scapanski

**3:30** Investigation into the detection of Semicarbazide, a Nitrofurazone indicator, in chicken. R. Duverna, **J.J. Johnston**, R. Kishore, J. Jarosh, C. Yee

**3:55** Discussion.

**4:10** Concluding Remarks.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**Pest Management Economics: Present & Future Considerations**

Cosponsored by BMGT
C. Hawkins, J. Roseman, *Organizers*
M. Dobbs, L. Duzy, *Organizers, Presiding*

**1:00** Introductory Remarks.

**1:05** Benefit and impact analyses under FIFRA. **T. Wyatt**

**1:30** Economic and pest management analysis of proposed pesticide regulations. J. Steggall, R. Goodhue, **K. Mace**, S. Blecker, R. Van Steenwyk

**1:55** Agricultural consolidation and digitization: Future development landscape. **A. Duehl**, B. Brauer, W. Poulson

**2:20** How Ecosystem Services Credit Exchanges Allow Private Companies and public agencies an opportunity to comply with environmental laws, regulations, policies and guidelines with a cost-effective, environmentally superior outcome. **B. Monaghan**, J. Bickel

**2:45** Intermission.

**3:05** Precision agriculture adoption and farm chemical use: Regions, soil variability, and farm size. **D. Schimmelpfennig**

**3:30** Economics of pest eradication programs: Lessons for resistance management. **G. Frisvold**

**3:55** Analysis of agrochemical use in california almonds during bloom. J. Durant, **B. Goodrich**

**4:20** Role of IPM in farm sustainability. **D. McCallister**, M. Parajulee

**4:45** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Plant-Insect-Microbe Communications in Agriculture: Early Career Scientist Symposium**

P. Kendra, J. Niogret, N. Tabanca, *Organizers, Presiding*

**1:00** Introductory Remarks.

**1:05** Interactions between spotted-wing *Drosophila* and fruit rot fungi in fall red raspberries. **M. Lewis**, K. Hamby

**1:30** Microbiome in host plant colonization and foraging of an invasive fruit fly. **C. Wong**, J. Hernandez, J.J. Beck, O. Liburd

**1:55** Additive microbe studies to elucidate semiochemicals responsible for attractive and/or repellent effects on *Drosophila suzukii*. **J.T. Brown**, C. Wong, J.J. Beck

**2:45** Intermission.

**3:05** New ion chromatography method for the quantification of ammonia, putrescine, and trimethylamine salts from cones used to trap female Mediterranean fruit flies, *Ceratitis capitata* (Diptera: Tephritidae). **A. Vazquez**, H. Pierre, R.A. King, L.K. Mosser, P. Kendra

**3:30** Stilbenes and fatty acids as mosquitocides for control of the malaria vector, *Anopheles gambiae*. **F. Démares**, Q. Coquerel, G. Richoux, K. Linthicum, J.R. Bloomquist

**3:55** Plant essential oils enhance public health insecticides through diverse modes of action. **E.J. Norris**, J.R. Bloomquist

**4:20** Spatial repellency and antennal responses of *Aedes aegypti* to plant-derived chemicals. **L. Yang**, S. Jiang, K. Linthecum, J.R. Bloomquist

**4:45** Concluding Remarks.

<section>

**Chemistry & Utilization of Agro-Based Materials**

**Session 2. Value-Added Products from Agricultural Raw Materials**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Food Bioactives: Chemistry & Health Effects**

**Food Bioactives: Chemistry and health effects**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Metals & Trace Elements in Food Safety, Health & Food Quality**

**Metals and Trace Elements in Food Quality and Safety**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Chemistry of Water Reuse Processes Toward Water Sustainability**

Sponsored by ENVR, Cosponsored by AGRO and PRES

**MONDAY MORNING**

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

**Analytical Methodologies for Process Chemistry & Formulation Research**

Cosponsored by ENVR
M. Evenson, D. Knueppel, Y. Shi, *Organizers, Presiding*

**9:00** Introductory Remarks.

**9:05** Global food analysis. **P.C. Dorrestein**

**9:30** Agrochemical forced degradation studies and their role in analytical method and formulation development. **D.S. Malkin**, R. Samame, M. Bishop, D. Knueppel

**9:55** Intermission.

**10:15** Determination of anionic polar pesticides as residual impurities in pesticide formulations by LC-MS/MS. **C. Love-Nkansah**

**10:40** Isolation of trace level impurities from agricultural technical grade active ingredients using semi-preparatory scale LC/MS. **M.D. Evenson**, D. Knueppel, P. Graupner, B. Moscato, C. Zu, R. Samame

**11:05** Optimizing separation for complex samples using two-dimensional liquid chromatography. L. Zang, **R. Giuffre**

**11:30** Application of SFC to achiral agricultural active ingredients. **J. Richards**, J. Houchins

**11:55** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**Agrochemicals & Water: Advances in Prevention, Monitoring, & Treatment**

Cosponsored by ENVR
S. Mathys, *Organizer*
H. B. Irrig, *Organizer, Presiding*
S. Mathys, *Presiding*

**9:00** Introductory Remarks.

**9:05** Passive samplers for surface water pesticide occurrence in remote areas of Northern California. **M.L. Hladik**, M. De Parsia, C. Sanders, J. Orlando

**9:30** Agrochemicals and water: Postharvest applications toward insect pest control. **S.S. Walse**

**9:55** Intermission.

**10:15** Implications of tertiary recycled water use for watering nondairy livestock on animal health and safety of food animal products. **D.J. Smith**, R.H. Poppenga

**10:40** Seasonal changes in glyphosate concentrations in the Lake Erie tributaries using high throughput monitoring with IC-ICP-MS. **S. Biswas**, L. Johnson, D.D. Snow

**11:05** Extrapolation of US prospective groundwater monitoring study to Colombia using GIS techniques for consideration of coffee uses. **M. Kim**, M. Robert

**11:30** Residues of synthetic pyrethroids in water bodies of different cropping system. **T. Jindal**, S. Thakur, K. Gulati

**11:55** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**Agrochemical Residue & Metabolism Chemistry**

Cosponsored by AGFD
K. Mastovska, X. Zhou, *Organizers*
J. J. Johnston, D. J. Smith, *Organizers, Presiding*

**9:00** Introductory Remarks.

**9:05** Avian exposure to current-use pesticides: Method development and environmental application. **M. Gross**, A. Elgin, C. Morrissey, M.L. Hladik, K. Kuivila

**9:30** Antemortem fluids as indicator of agrochemical exposure in food animals. **W.L. Shelver**, D.J. Smith

**9:55** Intermission.

**10:15** Establishing baseline sensitivity data using LCMS/MS to investigate dermal *in-vitro* absorption toxicological application. **A. Patel**, P. Trivedi

**10:40** Residue and metabolism of novel strobilurin fungicidal benzene kresoxim-methyl in eggplants. **H. Wang**, **L. Chen**

**11:05** Metabolism studies of dicamba in dicamba-tolerant crops. **A. Adio**

**11:30** Using metabolomics to provide evidence of a reactive metabolite of an avicide. **D.A. Goldade**

**11:55** Concluding Remarks.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**Advances in Exposure Modeling for Human Health Assessments**

Cosponsored by TOXI
Financially supported by Syngenta
C. B. Cleveland, *Organizer*
A. Z. Szarka, *Organizer, Presiding*
K. Tatum-Gibbs, *Presiding*

**9:00** Introductory Remarks.

**9:05** Application of an integrated approach for chemical evaluation of human cancer risk. **D.C. Wolf**

**9:55** Intermission.

**10:15** RISK21: Overview of a transparent, exposure-driven, and fit-for-purpose risk assessment framework. **S. Deglin**, M. Embry

**10:40** Determination of the kinetics of metabolism of dimethoate in rat and human liver microsomes. **G.C. Nallani**, K. Kassahun, L. Shen, A. Chandrasekaran

**11:05** High-throughput exposure assessment: Overview and integration on non-target dust analysis. **D.H. Bennett**

**11:30** Guidance for assessing human dietary exposure to newly expressed proteins in genetically modified crops. C. Mathesius, A. Sauve-Ciencewicki, J.A. Anderson, **C.B. Cleveland**, C. Fleming, G. Frierdich, L. Goodwin, M.C. Grunenwald, F. Laporte, E.A. Lipscomb, R. Oberdoerfer, J. Petrick, P.A. Bauman

**11:55** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Off-Target Transport of Field Applied Agricultural Chemicals: Study Designs, Monitoring, Modelling, & Risk Assessment**

Cosponsored by ENVR
R. Lerch, M. A. Locke, L. L. McConnell, P. J. Rice, N. Thurman, C. Truman, Q. Yao, *Organizers*
S. Grant, A. M. Ritter, *Organizers, Presiding*

**9:00** Introductory Remarks.

**9:05** Review of fumigant field emission studies for human exposure assessment. **W. Jiang**, E. Kwok, S. DuTeaux

**9:30** Development of the soil fumigant exposure assessment (SOFEA) model. **J. Buonagurio**, S. Cryer, I. van Wesenbeeck, R. Reiss

**9:55** Intermission.

**10:15** Comparison of three flux models across five field studies. **N. Pai**, E. Sall, J. Stryker, J. Popovic, R. Reiss, J. Cubbage

**10:40** Transport and deposition of pesticide residues in fog. **J.N. Seiber**

**11:05** Landscape-scale field studies to evaluate fate and transport of an agricultural fungicide to farm ponds. **A.M. Moore**, T. Wiepke, C. Truman, M. Cox, J.P. Hanzas

**11:30** Wetland water monitoring within intensive agricultural areas of Western Canada. **C.R. Harrington**, S.M. Chen, W. Chen, R. Underwood

**11:55** Concluding Remarks.

Section F

San Diego Convention Center
Room 33C

**2019 ACS International Award for Research in Agrochemicals: Advances in the Physiology & Biochemistry of Insect Control**

Cosponsored by AGFD, BIOL, MEDI, POLY‡ and PROF
M. D. David, K. D. Wing, *Organizers, Presiding*

**8:05** Introductory Remarks with Presentation of International Award.

**8:15** Many faces of nicotinic receptors as insecticide targets. **V.L. Salgado**

**9:05** Genetic analysis of nicotinic acetylcholine receptors and their interactions with insecticides. **T. Perry**, W. Chen, R. Ghazali, D. Christesen, T.C. Sparks, P. Batterham

**9:30** Spider toxins as novel allosteric modulators of insect nicotinic receptors. **F. Earley**, C. Chambers, P. Cutler, Y. Huang, D.J. Craik

**9:55** Intermission.

**10:15** Toward understanding the mechanism of selectivity of neonicotinoids: Interactions with loop C and loop DEG triangle of *Drosophila* Dα1 subunit with imidacloprid and thiacloprid. **K. Matsuda**

**10:40** Photochromic insecticidal molecules for insect behavior regulation. **X. Shao**

**11:05** Functional genomics of cys-loop ligand-gated ion channels, a superfamily of insecticide targets. **A.K. Jones**

**11:30** Concluding Remarks.

<section>

**Chemistry & Utilization of Agro-Based Materials**

**Session 3. Agro-Based Fibers and Textiles**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Current Advances in Water Analysis: From Citizen Scientists to Laboratory Breakthroughs**

Sponsored by ENVR, Cosponsored by AGRO and CEI

<section>

**Food Bioactives: Chemistry & Health Effects**

**Food Bioactives: Chemistry and health effects**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Metals & Trace Elements in Food Safety, Health & Food Quality**

**Metals and Trace Elements in Health & Nutrition**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Chemistry of Water Reuse Processes Toward Water Sustainability**

Sponsored by ENVR, Cosponsored by AGRO and PRES

## MONDAY AFTERNOON

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

**2019 ACS International Award for Research in Agrochemicals: Advances in the Physiology & Biochemistry of Insect Control**

Cosponsored by AGFD, BIOL, MEDI and PROF
M. D. David, K. D. Wing, *Organizers, Presiding*

**1:50** Introductory Remarks.

**1:55** Discovery and mode of action of a novel insecticide, broflanilide. **T. Nakao**, H. Katsuta, M. Nomura, T. Wakita, H. Daido, Y. Kobayashi, A. Kawahara, S. Banba

**2:20** Effects of amino acid substitutions at the intersubunit cavity on the sensitivity of the GABA receptor to fluralaner. **Y. Ozoe**, K. Yamato, F. Ozoe, M. Asahi, M. Kobayashi

**2:45** Intermission.

**3:05** Crop protection industry and the new age of insecticide discovery. **T.C. Sparks**, B.A. Lorsbach, F. Wessels

**3:30** Conservation of the voltage-sensitive sodium channel protein within the *Insecta*. J. Silva, **J.G. Scott**

**3:55** Insecticides that inhibit sodium channels. **D.M. Soderlund**

**4:20** Molecular basis of pyrethrum repellency in mosquitoes. **K. Dong**

**4:45** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**Challenges & Opportunities Facing Early Career Scientists: Early Career Scientist Symposium**

Cosponsored by AGFD and BIOL
S. Whiting, X. Zhou, *Organizers*
S. Whiting, X. Zhou, *Presiding*

**1:00** Introductory Remarks.

**1:05** Lessons learned from starting career at a contract research organization. **S. Whiting**

**1:30** Starting a career in academia: Navigating the first couple of years of a tenure-track position. **A.D. Gross**

**1:55** Challenges of transitioning from a small college to a large world. **K. Maurey**

**2:20** What is work/life balance? Reconciling parenthood with an academic career in STEM. **S. O'Neal**

**2:45** Intermission.

**3:05** Stop signs and alternative routes, navigating the road to a successful career. **K. Tatum-Gibbs**

**3:30** More than a box of rocks: Experiences of a US Geological Survey research chemist. **M. Gross**

**3:55** Challenges facing an early career scientist when making the transition from education to industry. **M.E. Bull**, M. Chandrashekhar, M. Ponte

**4:20** Excel in your career: Tips and advice. **M. Ma**

**4:45** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**Water Scarcity: Challenges for Agriculture**

Cosponsored by ENVR and PRES
Financially supported by Golden Pacific Labs
T. F. Moate, M. D. PazCarpio-Obeso, J. N. Seiber, *Organizers*
J. Carvalho, *Organizer, Presiding*

**1:00** Introductory Remarks.

**1:05** Aftermath of California's most recent drought: 2012–2016. **S. Sandoval**

**1:30** Salt mitigation in irrigated crops: Reducing negative impacts past, present and possibilities for the future. **S. West**

**1:55** Biogeosystem technique for healthy soil, water, and environment. **V.P. Kalinitchenko**, A. Glinushkin, M. Sokolov, A. Batukaev, T. Minkina, V. Zinchenko, V. Chernenko, V. Startsev, S. Mandzhieva, S. Sushkova, D. Makarenkov, L. Il'ina, A. Rykhlik, G. Larin

**2:20** Saltwater greenhouse: Combining engineering and plant science to deliver a new concept in food and water security. **M. TESTER**

**2:45** Intermission.

**3:05** Impact of the application of natural biostimulants on water use in crop production under adequate and reduced water availability. **G. Povero**, A. Biasone, A. Santaniello, N. Briglia, A. Petrozza, A. Piaggesi

**3:30** Skincare meets agriculture: Cross-over idea creates a novel, water-saving biostimulant with field results presented. **C. Jordan**

**3:55** Chemists Without Borders' model for saving water and capturing carbon through biochar production and use. **A.W. Cooper**, B. Vaccaro, R. Kronquist

**4:20** Best management practices to keep pesticides out of water. **S. Sandoval**

**4:45** Panel Discussion.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**Advances in Exposure Modeling for Human Health Assessments**

Cosponsored by TOXI
Financially supported by Syngenta
C. B. Cleveland, *Organizer*
A. Z. Szarka, *Organizer, Presiding*
K. Tatum-Gibbs, *Presiding*

**1:00** Introductory Remarks.

**1:05** Benchmark dose modeling and 21st century application in predictive safety assessment. **V. Bhat**

**1:55** Tiered approach for exposure and risk assessment of inert ingredients in pesticide product formulations. **M.C. Grunenwald**, A.Z. Szarka, T.S. Ramanarayanan

**2:20** Reevaluation as a starting point to implement the risk assessment of pesticides for operators, workers, residents, and bystanders in Brazil. **J. Braz**, F. Neves

**2:45** Intermission.

**3:05** Survey of the Brazilian agricultural scenarios to support the development of the database of occupational exposure in Brazil. **F.C. Cremaschi Palma**, **D. Laustenchalaeger**, **K. Cazarin**, **M. Grigoli**

**3:30** Development of metrics for screening for chemical storage near drinking water sources. **C.N. Lowe**, K. Isaacs

**3:55** Discussion.

**4:15** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Off-Target Transport of Field Applied Agricultural Chemicals: Study Designs, Monitoring, Modelling, & Risk Assessment**

Cosponsored by ENVR
S. Grant, R. Lerch, A. M. Ritter, N. Thurman, C. Truman, Q. Yao, *Organizers*
M. A. Locke, L. L. McConnell, P. J. Rice, *Organizers, Presiding*

**1:00** Introductory Remarks.

**1:05** Optimization of farm agronomic practices to meet environmental quality requirements. **M. Winchell**, B. Patterson

**1:30** Field methods for assessing vegetative filter strip (VFS) impacts on benzovindiflupyr runoff transport in the Southeastern United States. T. Wiepke, C. Truman, J.P. Hanzas, **M. Arpino**, C. Harris

**1:55** Multi-year field studies evaluating the benefits of vegetative filter strips. **A.M. Ritter**, D.A. Desmarteau, G. Goodwin, J. Trask, L. Carver, M. Cox, A.M. Moore, C. Truman

**2:20** Modelling experiments with vegetated filter strips with a new version of VFSMOD: Calibration, uncertainty analysis and recommendations for regulatory use. **R. Sur**, S. Reichenberger, C. Kley, S. Sittig, S. Multsch

**2:45** Intermission.

**3:05** Effect of the VFSMOD pesticide trapping equation on environmental exposure assessments. R. Munoz-Carpena, G. Fox, **A.M. Ritter**

**3:30** Regulatory perspective: Opportunities and challenges in considering vegetative filter strips in pesticide risk assessments. **N. Thurman**, M. Appleyard, K. Costello

**3:55** Concluding Remarks.

Section F

San Diego Convention Center
Room 33C

**Metabolomics & Metabolite Identification in Agricultural Research**

J. Balcer, A. Chen, J. Ferguson, P. Wei, *Organizers, Presiding*

**12:55** Introductory Remarks with JAFC Award Presentation.

**1:05** Antifungal metabolite profiling of high value compounds in fruit peel waste. **A. Munkacsi**, M. Mokhtari, M. Jackson, M. Hooker, J. Harvey, A. Brown, D. Ackerley, N. Ritson, R. Keyzers

**1:30** Novel mass spectrometry tools to speed the identification of metabolites and impurities. **J.R. Gilbert**, J. Balcer, Y. Adelfinskaya, D. McCaskill, N. Wang, J.A. Godbey, M. Madary, M.P. Mawn, C. Zu

**1:55** *In vitro* metabolism of semi natural product TL-909 and identification of its complex metabolic products by HPLCMSTOF, UPLCMSTOF and CECMSTOF. **D. Safarpour**, L. O'Brien

**2:20** Metabolism prediction and metabolite identification using biotransformer: Applications in crop protection discovery. **Y. Djoumbou Feunang**, J. Balcer, D. Tomandl

**2:45** Intermission.

**3:05** Discovery of plant-derived metabolite markers for pest management strategies. J.H. Kim, G.P. Head, **P. Wei**

**3:30** Establishing a spatial metabolomics workflow that integrates MALDI imaging with new trapped ion mobility metabolomics for more comprehensive identification and validation. **D.S. Cornett**, A. Barsch, C. Henkel, M. Witt, M. Szesny

**3:55** Concluding Remarks.

<section>

**Chemistry & Utilization of Agro-Based Materials**

**Session 4. Improved Utilization of Agricultural Raw Materials**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Sensors & Biosensors for Widespread Environmental Monitoring**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Nanotechnology Applications for Food & Agriculture**

**Nanotechnology applications for food and agriculture**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Food Bioactives: Chemistry & Health Effects**

**Food Bioactives: Chemistry and health effects**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Chemistry of Water Reuse Processes Toward Water Sustainability**

Sponsored by ENVR, Cosponsored by AGRO and PRES

<section>

**Metals & Trace Elements in Food Safety, Health & Food Quality**

**Analytical Methods of Metals and Trace Elements**

Sponsored by AGFD, Cosponsored by AGRO

**MONDAY EVENING**

Section A

Placeholder

**Sci-Mix**

C. B. Cleveland, *Organizer*

**8:00 - 10:00**

Application of kinetic models for degradation rate of triazole pesticides in perilla leaves. **H. Kim**, S. Lee, K. Se-Yeon, A. Sarker, H. Jeong, A. Nam, T. Kim, J. Kim

Development of multi-residue analysis method of pesticides in organic agro-materials. **H. Jeong**, K. Se-Yeon, S. Lee, A. Sarker, H. Kim, A. Nam, J. Kim

Structure determination of DNA adducts from chlorobenzonitrile pesticides. **M. Byron**, D.W. Boerth

Field screening approaches for monitoring whole-plant response modulated by biostimulants. **M. Park**, D. Amaral, P.H. Brown

Combatting plant-parasitic nematodes with biorational pesticides. **J.S. Klimavicz**, J.O. Barizon, G.L. Tylka, J.R. Coats

Plant terpenoids as a source of novel nematicides. **C. Wong**, J.R. Coats

Giving ticks 'dry mouth' through chemical modulation of inward rectifier potassium channels as a mechanism to prevent blood feeding. **Z. Li**, D. Swale

Inducing neural failure through chemical inhibition of insect inward rectifier potassium channels. **R. Chen**, D. Swale

Identification of novel target sites to reduce salivary gland function and feeding of *Aedes aegypti*. **A. Soohoo-Hui**, D. Swale

Toxicological relevance of potassium ion channels to honey bee immune health. **C.J. Fellows**, T.D. Anderson, D. Swale

Toxicological and neurophysiological characterization of natural product based chromene analogs to insect pests. **S. McComic**, D. Swale, K.M. Meepagala

Repurposing isoxazoline and diamide insecticides to control the sand fly, *Phlebotomous papatasi*. **M. Nguyen**, Z. Li, L. Foil, D. Swale

Developing an alternative method for deploying toxic sugar bait technologies. **C.L. Corona**, J.S. Klimavicz, J.R. Coats

Synergistic effects of potassium channel blockers and pyrethroids: Mosquitocidal activity and neuronal mode of action. **S. Jiang**, J.R. Bloomquist

Larvicide activity of biorational compounds to pyrethroid-resistance *Aedes aegypti* mosquitoes. **E. Johnson**, S. O'Neal, L. Rault, T.D. Anderson

Ion-specific influences on the photodegradation of benzobicyclon hydrolysate in seawater. M. Knight, E.N. Vebrosky, **L. Basirico**, **K.L. Armbrust**

Atmospheric fate of neonicotinoids as pure compounds and in formulations. **A. Rohrbacher**, B.J. Finlayson Pitts

Evaluation of DDT bioaccumulation in earthworms from a historically-contaminated orchard using Bayesian hierarchical modelling. **Z. Yang**, M.O. Anderson, T. LaChance, R.E. Plummer, D. Jackson, L.L. McConnell, C.J. Hapeman, A. Torrents

Sublethal effects of chlorantraniliprole exposure to a beneficial insect species. **J. Williams**, D. Swale, T.D. Anderson

**TUESDAY MORNING**

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

**Advances in Analytical Technologies Supporting Environmental Fate, Metabolism, & Residue Analysis**

Cosponsored by ENVR
Y. Yuan, *Organizer*
K. Kuppannan, M. Ma, *Organizers, Presiding*

**8:05** Introductory Remarks.

**8:10** Determination of nitrite residues in feral swine tissues. **B.G. Abbo**

**8:35** Use of PolyCYPs® enzymes for accessing mammalian metabolites of agrochemicals and pharmaceutical drugs. S. Lai, A. de Riso, **L. Evans**, W. Hodds, E. Hopkins, A. Khan, K. Nytko, R. Phipps, V. Poon, F. Scheffler, J. Shanu-Wilson, J.C. Steele, S. Wrigley

**9:00** Temporal and spatial study of neuropeptidomic changes in response to hypoxia via a multi-faceted mass spectrometry platform. **L. Li**, A. Buchberger, C. Sauer, K. DeLaney, N. Vu, Y. Liu

**9:25** Determination of drugs and pesticides in catfish feed for contaminant traceback. **D.L. Sparks**, J.S. Boone, C.V. Childers, A. Meredith, G. Hagood, A.E. Brown

**9:50** Intermission.

**10:10** In-house suspect screening database as a tool to increase detection coverage for analysis of contaminants in environmental samples. **M.E. Guardian**, P. He, D.S. Aga

**10:35** US EPA CompTox Chemicals Dashboard to support mass spectrometry targeted and non-targeted analysis. **A.J. Williams**, A. Chao, T. Cathey, T. Transue, E.M. Ulrich, J. Sobus

**11:00** Innovative method for simultaneous determination of pesticides, veterinary drugs, and environmental contaminants residues in beef. **S. Monteiro**, E. Ninga, S.J. Lehotay, Y. Sapozhnikova

**11:25** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**2019 ACS International Award for Research in Agrochemicals: Advances in the Physiology & Biochemistry of Insect Control**

Cosponsored by AGFD, BIOL, MEDI and PROF
M. D. David, K. D. Wing, *Organizers, Presiding*

**8:05** Introductory Remarks.

**8:10** Nicotinamide is an endogenous modulator of insect chordotonal organs. V.L. Salgado, **K. Lelito**

**8:35** Genetics of resistance to Cry1 proteins in *Spodoptera frugiperda*. **G. Head**, R. Nauen, L. Flagel, D. Boaventura, S. Martinelli, P. Dourado

**9:00** Insect glia as a cellular target for insecticide development. **D. Swale**

**9:25** Proinsecticides as potential resistance management tools. **M.D. David**

**9:50** Intermission.

**10:10** Novel biomedical technologies which may apply to insecticide discovery. **K.D. Wing**

**10:35** Unusual modes of action of pyrethroid-derived spatial repellents. **J.R. Bloomquist**

**11:00** Discussion.

**11:15** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**Metabolomics & Metabolite Identification in Agricultural Research**

J. Balcer, A. Chen, J. Ferguson, P. Wei, *Organizers, Presiding*

**8:30** Introductory Remarks.

**8:35** Novel approach for the non-targeted profiling of oligomeric nutraceuticals in fruits using reporter-ion triggered tandem mass spectrometry. **N. Tharayil**, E. Leonard

**9:00** New methods for the automated structural classification of natural products. **W.H. Gerwick**, C. Zhang, R. Reher, S. Zhu, N. Roberts, G. Cottrell

**9:25** Advanced software tools for metabolite identification and metabolomics analysis in agro chemical research. **C. Ding**, M.P. Mawn, J. Balcer

**9:50** Intermission.

**10:10** Insect repellents and insecticides from plants and microbes. **K.M. Meepagala**

**10:35** Determining characteristics of cannabis plants to distinguish cultivars and growing conditions using high resolution QTOF mass spectrometry. **P. Winkler**, C. Butt, D. Hughes, S. Churchill, M. Aiello

**11:00** Putative gene mode of action discovery by GC/MS and LC/MS metabolomics. **J. Hazebroek**, B. Ruddy, T. Harp, C. Vlahakis, L. Perugini, L. Peddicord

**11:25** Concluding Remarks.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**Surfactant & Colloid Science Applied to Formulations**

Cosponsored by COLL
R. Acosta Amado, B. Rauzan, S. Sumulong, *Organizers, Presiding*

**8:30** Introductory Remarks.

**8:35** Designing tools for improving the performance of automotive clear coat system. **B. Cao**, C. Harris

**9:00** Removing the guesswork from stability analysis: Quantifying and prediction of the physical stability of dispersions. **M. Vanden Eynden**, C. Tisserand, y. lefeuvre, P. Bru, G. Meunier

**9:25** Using design of experiments to optimize complex formulations. **B. Rauzan**, R. Acosta Amado, H. Jeon, M. Evenson, T. Minnicks, N. Skaggs

**9:50** Intermission.

**10:10** Structured surfactant technology: Novel suspensive system by surfactant self-assembly, allowing for complex agrochemical formulations not achievable through conventional methods. **E. Weber**

**10:35** Formulations based on self-assembled polymer systems. **R. Nagarajan**

**11:00** Structuring of fertilizer compatible suspension concentrates. **J. Wall**

**11:25** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Biostimulants in Agriculture: Chemistry & Regulatory Aspects**

Cosponsored by BIOL, MEDI and TOXI
P. Halarnkar, K. D. Wing, *Organizers*
M. E. Koivunen, *Organizer, Presiding*

P. Halarnkar, *Presiding*

**8:20** Introductory Remarks.

**8:25** Biostimulants: Their function and effective use in modern agriculture. **P.H. Brown**, D. Amaral, M. Park

**9:00** Mining phytomicrobiomes for microbial compounds to replace synthetic fertilizers and fungicides for sustainable agriculture. **A.M. Hirsch**, N. Khan, P. Martínez-Hidalgo, T. Ice, M. Maymon, E.A. Humm, K.F. Faull

**9:25** Commercial *Ascophyllum nodosum* extracts (Acadian Plant Health) reduce plant stress resulting in improved plant growth and productivity. **h. little**

**9:50** Intermission.

**10:10** M-trophs for sustainable agriculture. **J. Kerovuo**

**10:35** Analysis of *Ascophyllum nodosum* extracts and other biostimulant products using NMR metabolomics and other analytical methods to evaluate final product composition and consistency. **D. Hiltz**, E. Kerrin, L. Hamilton, A. Banskota

**11:25** Concluding Remarks.

Section F

San Diego Convention Center
Room 33C

**Kenneth A. Spencer Award & Related Presentations**

S. J. Leibowitz, *Organizer, Presiding*
B. A. Lorsbach, *Presiding*

**8:05** Introductory Remarks with Presentation of Spencer Award.

**8:15** Science at the interface: Natural products and computational approaches to understanding and exploiting their chemistry. **T.C. Sparks**

**9:00** Synthesis of GABAaR antagonists and related chemical space. **R.A. Shenvi**

**9:25** Innovative approaches to deliver natural product and natural-derived solutions for crop protection. **B.A. Lorsbach**, R. Cicchillo, N. Garizi, D. Hahn, K.G. Meyer, T.C. Sparks

**9:50** Intermission.

**10:10** Discovery and use of natural products as mosquito repellents. **C.L. Cantrell**, A. Ali

**10:35** NCI program for natural product discovery: Creating natural product libraries for high-throughput screening. **C. Thornburg**, J. Britt, J. Evans, R. Akee, J. Whitt, S. Trinh, M. Harris, J. Thompson, T. Ewing, S. Shipley, P. Grothaus, D. Newman, J. Schneider, T. Grkovic, B. O'Keefe

**11:00** Concluding Remarks.

<section>

**Chemistry & Utilization of Agro-Based Materials**

**Session 5. Nanoscience and Related Materials**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Chemistry & Applications of Free Radical-based Technologies for Water Treatment & Purification**

**UV-based free radicals-based technologies and application**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Nanotechnology Applications for Food & Agriculture**

**Nanotechnology applications for food and agriculture**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Agnes Rimando Memorial Symposium in honor of the Scientist & International Ambassador of Agricultural & Food Chemistry**

**Agnes Rimando Memorial Symposium in Honoring the Scientist and International Ambassador of Agricultural and Food Chemistry**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Chemistry of Water Reuse Processes Toward Water Sustainability**

Sponsored by ENVR, Cosponsored by AGRO and PRES

<section>

**Non-targeted Analysis to Understand Fate & Effects of Pharmaceuticals & Emerging Contaminants in Agriculture & Natural Environments**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**USDA-ARS Sterling B. Hendricks Memorial Lectureship Symposium**

**USDA-ARS Sterling B. Hendricks Memorial Lectureship Symposium**

Sponsored by AGFD, Cosponsored by AGFD and AGRO‡

<section>

**Sensors for Water Quality Assessment in Resource Limited Environments**

Sponsored by ENVR, Cosponsored by AGRO

## TUESDAY AFTERNOON

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

**Kenneth A. Spencer Award & Related Presentations**

S. J. Leibowitz, *Organizer, Presiding*
B. A. Lorsbach, *Presiding*

**2:15** Introductory Remarks.

**2:20** Two scalable platforms for large scale discovery of microbial natural products. **N.L. Kelleher**

**2:45** Development of novel carbohydrate-based macrocyclic picolinamide fungicides. **K. Bravo-Altamirano**, F. Li, R. Heemstra, K.G. Meyer, P. Graupner, C. Yao

**3:10** Intermission.

**3:30** AI and natural agricultural active agent discovery. **N. Magarvey**

**3:55** Discovery of florylpicoxamid, a new picolinamide for disease control. **K.G. Meyer**, C. Yao, Y. Lu, K. Bravo, Z. Buchan, J. Daeuble, K. DeKorver, J. Herrick, D.M. Jones, B.A. Loy, J. Rigoli, N. Wang, J. Wilmot, D. Young

**4:20** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**Simulating Fumigant Transport & Emissions: The Evolving Role of Modeling in California Regulations**

Cosponsored by ENVR
S. Krepich, *Organizer*

E. Vidrio, *Organizer, Presiding*

**1:00** Introductory Remarks.

**1:05** Comparison between field-estimated and HYDRUS-simulated emission of 1,3-Dichloropropene from agricultural fields. **M. Kandelous**, C. Brown

**1:30** Estimation of bystander exposure of sulfuryl fluoride during structural fumigations of California detached single family houses. **J. Tao**

**1:55** Environmental effects on fumigant emission from soil surface: Modeling perspective. **M. Kandelous**, C. Brown

**2:20** Procedure to select meteorological data for air dispersion modeling of pesticide applications in California. **J. Tao**

**2:45** Refining dispersion modeling to meet evolving regulatory requirements. R. Sullivan, **D.A. Sullivan**

**3:10** Intermission.

**3:30** Using HYDRUS to estimate 1,3-D emissions under California conditions. **C. Brown**, M. Kandelous, F. Sartori, C. Collins, F. Spurlock

**3:55** AERFUM: Integrated air dispersion modeling system for soil fumigants. **Y. Luo**

**4:20** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**What does Nanotechnology Have to do with Agriculture?**

Cosponsored by COLL
J. Hughes, S. Kweskin, *Organizers, Presiding*

**1:00** Introductory Remarks.

**1:05** Effects of nanotechnology fertilizers on soybean plant runoff water. **J. Taylor**

**1:30** Nanoscale agrochemicals for precision agriculture and sustainable environment. **R. Raliya**

**1:55** Nanoparticles of Cu and Si for the suppression of plant diseases. **W. Elmer**, C. Ma, L. Pagano, N. Zuverza-Mena, R. De La Torre-Roche, C. Perez, J. Borgata, J.T. Buchman, C.L. Haynes, R.J. Hamers, J.C. White

**2:20** Molecular and physiological responses of alfalfa (*Medicago sativa*) plants exposed to nano, bulk, and ionic copper compounds. **K. Cota-Ruiz**, Y. Yuqing, C. Valdes, E. Eguiarte, J.I. García-López, J.A. Hernández.Viezcas, J. Peralta-Videa, J.L. Gardea-Torresdey

**2:45** High aspect ratio nanomaterials enable biomolecule delivery and transgene expression or silencing in intact plants. **G.S. Demirer**, H. Zhang, J. De Lima Matos, N. Goh, F. Cunningham, Y. Sung, B. Staskawicz, M. Landry

**3:10** Intermission.

**3:30** Evaluating the potential of a suite of metal colloids for the treatment of pathogenic diseases: Case study for citrus greening disease. **T. Ameh**, C. Sayes, E. Braswell

**3:55** Bioinspired development of crop foliage-adhesive nanopesticides to enhance folia retention. **Z. Zeng**, M. Yu, H. Chen, H. Cui

**4:20** Utilization of cellulose nanomaterials in agriculture: Current status and future prospects. **G. Kandhola**, J. Batta-Mpouma, M. Lisunova, J. Kim

**4:45** Concluding Remarks.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**Surfactant & Colloid Science Applied to Formulations**

Cosponsored by COLL
R. Acosta Amado, B. Rauzan, S. Sumulong, *Organizers, Presiding*

**1:25** Introductory Remarks.

**1:30** Enhanced microbial pesticides via rainfastness and UV resistance improvement. **C. Woelfle-Gupta**, S. Arumugam, D. Saucy, M. Carter, Y. Tan, S.L. Jordan, A. Izmitli, B. Ajayi

**1:55** Approaches in waterborne basecoat rormulation practice to minimize volatile organic compounds (VOCs). **M. MacDonald**, L. Humbert

**2:20** Influence of solvent chemistry on the viscosity of high-load emulsifiable concentrate agrochemical formulations. **R. Acosta Amado**, N. de Castro, H. Jeon

**2:45** Emulsifiable concentrate (EC) development and beyond. **F. Tu**

**3:10** Intermission.

**3:30** Colloidal nanocrystal approach to fighting counterfeit products. **A.F. Smith**, S.E. Skrabalak, J.D. Smith

**3:55** Natural wax nanoparticles induce changes in morphology and physical properties of polysaccharides after spray drying: Applications for development of controlled-release formulations. **C. Espinoza-González**, N. Navarro-Guajardo, C. Villanueva-González, C. Martínez-Lara, L. Arizmendi-Galaviz, A. Ledezma-Pérez, J. Romero-García

**4:20** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Next Generation Watershed Modeling of Agrochemicals**

Cosponsored by ENVR
N. Peranginangin, N. Thurman, M. Winchell, *Organizers, Presiding*

**1:25** Introductory Remarks.

**1:30** Overview and application of the SWAT+ model for watershed scale aimulation of agrochemicals. **H. Rathjens**, M. Winchell, P.L. Havens

**1:55** Modeling the co-occurrence of pesticides and degradation products in surface water at the landscape scale. **P.K. Janney**, J.J. Jenkins

**2:20** Methods for representing watersheds in a tiered approach for pesticide risk assessments. **N. Thurman**, J. Hook

**2:45** Towards the derivation of realistic dilution factors for drinking water abstraction combining GIS analysis and landscape level modelling. S. Gebler, T. Schröder, **E. Henry**

**3:10** Intermission.

**3:30** Comparison of pesticide concentrations observed in community water systems to predictions from US regulatory aquatic exposure models. **J. Dunne**, N. Peranginangin, L. Padilla, M. Winchell

**3:55** Panel Discussion.

**4:20** Concluding Remarks.

Section F

San Diego Convention Center
Room 33C

**Biostimulants in Agriculture: Chemistry & Regulatory Aspects**

Cosponsored by BIOL, MEDI and TOXI
P. Halarnkar, *Organizer*
M. E. Koivunen, K. D. Wing, *Organizers, Presiding*
P. Halarnkar, *Presiding*

**1:20** Innovation Award Ceremony and Introductory Remarks.

**1:30** History, status, and future potential of natural products for pest management and plant health. **P.G. Marrone**

**2:20** Managing the challenges associated with continued growth of biostimulant technologies. **S. Semones**

**2:45** Guidance for plant regulator label claims, including plant biostimulants. **R.S. Jones**

**3:10** Intermission.

**3:30** U.S. regulation and legislation impacting the plant biostimulant industry. **D.G. Beaudreau**

**3:55** Update on regulatory developments related to biostimulants. **K. Matthews**

**4:20** Discussion.

**4:35** Concluding Remarks.

<section>

**Chemistry & Applications of Free Radical-based Technologies for Water Treatment & Purification**

**Various free radicals-based technologies**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Chemistry & Utilization of Agro-Based Materials**

**Session 6. Advanced Materials from Agricultural Sources**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Biochar & Hydrochar for Energy, Environmental & Agricultural Applications**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Proposition 65 on Food Safety**

**Proposition 65 on Food**

Sponsored by AGFD, Cosponsored by AGRO

**TUESDAY EVENING**

<section>

**Biochar & Hydrochar for Energy, Environmental & Agricultural Applications**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Chemistry & Applications of Free Radical-based Technologies for Water Treatment & Purification**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Chemistry of Water Reuse Processes Toward Water Sustainability**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Non-targeted Analysis to Understand Fate & Effects of Pharmaceuticals & Emerging Contaminants in Agriculture & Natural Environments**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Sensors & Biosensors for Widespread Environmental Monitoring**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Sensors for Water Quality Assessment in Resource Limited Environments**

Sponsored by ENVR, Cosponsored by AGRO

## WEDNESDAY MORNING

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

### Process Research & Development in Crop Protection

K. Gray, W. Su, Q. Yang, *Organizers*
K. Gray, *Presiding*

**8:05** Introductory Remarks.

**8:10** Evaluation of [3 + 2] cyclization strategies to 3-(3-Chloro-1 *H*-pyrazol-1-yl)pyridine, a key intermediate for the insecticidal active tyclopyrazoflor. **Q. Yang**, X. Li, B.A. Lorsbach, G. Roth, D. Pordhorez, R. Ross, N. Niyaz, A. Buysse, D. Knueppel, J. Nissen

**8:35** Fit-for-purpose optimization of the route to tyclopyrazoflor featuring [3 + 2] cyclization of 3-hydrazinopyridine dihydrochloride and methyl acrylate. **X. Li**, Q. Yang, B.A. Lorsbach, J. Muhuhi, **G. Roth**, K. Gray, D.E. Podhorez

**9:00** Streamlining the chemical development process through continuous flow and task automation. **C. Breen**, T.F. Jamison

**9:50** Intermission.

**10:10** Scalable synthesis of methyl 3-((3,3,3-trifluoropropyl)thio)propanoate via thiol-ene chemistry. **K. Gray**, P. Heider, P. McGough, M. Ondari, J. Devaraj, Q. Yang, G. Frycek, B. Graham, J. Neuman, B.A. Lorsbach, Y. Zhang

**10:35** C–C cleavage/cross-coupling approach to C–H functionalization of cyclic amines. **J. Jurczyk**, J. Roque, Y. Kuroda, L. Goettemann, C. Roberts, D. Adpressa, J. Sauri, L. Joyce, C. Yeung, R. Sarpong

**11:00** Development of a scalable synthesis of chiral allyl ether 6, a key intermediate *en route* to an experimental picolinamide fungicide. **S.N. Good**, F. Li, G.T. Whiteker

**11:25** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**Pollinators in Agroecosystems: Current Science Issues & Risk Assessment Approaches**

Cosponsored by ENVR
Financially supported by Intrinsik
V. Kramer, J. R. Purdy, T. Steeger, *Organizers*
C. Douglass, A. Krueger, *Organizers, Presiding*
J. Purdy, *Presiding*

**8:05** Introductory Remarks.

**8:10** Protecting pollinators in agricultural land: Toolbox of risk mitigation measures associated to pesticide use. **A. Alix**

**8:35** Pollinators as keystones of agriculture and natural ecosystems: Impact of organosilicone spray adjuvants on their health and reproduction. **D.L. Cox-Foster**, E. Klinger, W.J. Doucette

**9:00** Pesticides in honey bee colonies: Real world exposure and associated morbidity over seven years (2011–2017) in the USA. **D. van Engelsdorp**, K. Traynor, R. Rose, K. Rennich

**9:25** Quantification of neonicotinoid residues in a pollinator attractive habitat. **M.J. Hall**, V. Dang, G. Zhang, M.E. O'Neal, S.P. Bradbury, J.R. Coats

**9:50** Intermission.

**10:10** Toxicity of some ready-to use and common garden pesticides to non-Apis bees. **N. Joshi**, O. Kline, J. Belsky

**10:35** Semi-field testing to address the risk of the insecticide chlorantraniliprole on the brood of the honey bee (*Apis mellifera, Hymenoptera, Apidae*). **A. Dinter**, A. Samel, K. Brugger

**11:00** Movement of Varroa mites and the spread of viruses they transmit among colonies: Challenges to quantification of pesticide effects. **G. De Grandi-Hoffman**, V. Corby Harris, J. Chen, M. Chambers, H. Graham, E. Watkins DeJong, N. Ziolkowski

**11:25** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**Transfer of Analytical Methods: The Good, the Bad, & the Ugly**

R. M. Bennett, K. Clark, J. E. Foster, L. Riter, *Organizers, Presiding*

**8:05** Introductory Remarks.

**8:10** Method development and validation for determination of mancozeb and its metabolite ETU via LC-MS/MS in soil, water, plant, and animal matrices. A. Li, **A.D. Budgeon**, C.M. Bianca

**8:35** Two perspectives on transfer of residue analytical methods. **L. Riter**, K. Clark

**9:00** Key elements of successful method transfers. **K. McInerney**

**9:25** Method development and optimization for extracting a pesticide from bee and corn pollen. **S. Whiting**, W. Fain, E. Vogl, K. Clark

**9:50** Intermission.

**10:10** Contract laboratory perscpective on the transfer of LC-MS/MS methods. **S. Sharp**, S. Perez

**10:10** Stay tuned! Strategically-developed GLP EPA residue analytical methods to meet the regulatory requirements of different global regions. **J.E. Foster**

**10:35** Discussion.

**11:00** Concluding Remarks.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**Environmental fate, transport, & modeling of agriculturally-related chemicals**

Financially supported by Stone Environmental
S. Jackson, R. L. Warren, *Organizers, Presiding*

**8:30** Introductory Remarks.

**8:35** Challenges, approaches and achievements on surface water mineralization with amended solids: Case study for insoluble compounds and high volatility. **R. Lomax**, M. Ponte

**9:25** Hydrolysis of dichloroacetamide herbicide safeners: Rates and transformation products. **M.E. McFadden**, J.D. Sivey, G.H. LeFevre, D.M. Cwiertny

**9:50** Intermission.

**10:10** Sorption-desorption hysteresis linked to formation of metastable states: How much does it cost (in terms of free energy). **M. Borisover**

**10:35** Summary of 'Scientific Opinion about the Guidance of the Chemical Regulation Directorate (UK) on how aged sorption studies for pesticides should be conducted, analysed and used in regulatory assessments': Released in August 2018 by EFSA. **P. Sharma**

**11:00** Inverse modeling approaches for derivation of aged sorption parameters from terrestrial field dissipation studies. **P. Sharma**

**11:25** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Development of Novel Vector Control Technologies**

Cosponsored by MEDI
A. D. Gross, E. J. Norris, D. Swale, *Organizers, Presiding*

**8:05** Introductory Remarks.

**8:10** Convergence of the octopaminergic and muscarinic signal transduction pathways in *Drosophila melanogaster*. **A.D. Gross**, N. Xie

**8:35** Will resistance render pyrethroids ineffective for house fly control in the near future?. J.C. Freeman, **J.G. Scott**

**9:00** How many sodium channel mutations confer pyrethroid resistance in *Aedes aegypti*?. **K. Dong**

**9:25** Towards new modes of action for reducing arthropod-borne disease in honey bee colonies. **T.D. Anderson**

**9:50** Intermission.

**10:10** Developing novel mechanism insecticides to inhibit feeding and vectorial capacity of the cotton aphid, *Aphis gossypii*. **D. Swale**

**10:35** Do ABC transporters contribute to pyrethroid resistance in the Puerto Rico strain of *Aedes aegypti*?. **L. Rault**, E. Johnson, S. O'Neal, T.D. Anderson

**11:00** Pathogen prevalence in the blacklegged tick *Ixodes scapularis*: Does pathogen infection alter tick behaviors?. **A. Li**, G. Xu

**11:25** Concluding Remarks.

Section G

Placeholder

**Advances in Analytical Technologies Supporting Environmental Fate, Metabolism, & Residue Analysis**

Cosponsored by ENVR
K. Kuppannan, M. Ma, Y. Yuan, *Organizers*

**11:30 - 2:00**

Development of analytical method of cyantraniliprole residue in Wilford swallow-wort (*Cynanchum wilfordii* (Maxim.) Hemsl.). **J. Choi**, S. Leem, H. Ham, J. Kim, H. Choi, **J. Hur**

SFC-MS based analytical strategy for stereoisomer analysis in environmental fate and metabolism studies. **X. Zhou**, J.A. Godbey, T.K. Trullinger

Method development for analysis of herbicide glyphosate and its metabolite aminomethylphosphonic acid in human urine samples using GC-MS/MS. **J. Tang**, T. Baker, K. LeVanseler, N. Cole

Degradation of tetracycline antibiotics in livestock and poultry manure during anaerobic digestion. **J. Kasumba**, K. Appala, G. Agga, J.H. Loughrin, E.D. Conte

Application of multiple mass defect filters to improve the quality of total ion chromatograph in high resolution MS analysis. **M. Zhang**, D. Nabb

Development of the analytical method for carbendazim in a traditional herbal medicine, *Astragalus membranaceus,* using HPLC. **B. Ju**, J. Lee, E. Park, X. Yuan, R. Go, M. Rehan, E. Jung, H. Han, J. Kim

Determination of cannabinoid content in bench-top wipes taken for pesticide residue analysis from cannabis growth facilities. **J.J. Doherty**, N. Aldrich, J. Lee, S. Safie, J.M. Clark

Efficiency evaluation of extraction and clean-up for multi pesticides by LC-MS/MS in agricultural commodities. **S. Lee**, K. Se-Yeon, H. Kim, H. Jeong, A. Nam, J. Kim

Placeholder

**Agrochemical Residue & Metabolism Chemistry**

Cosponsored by AGFD
J. J. Johnston, K. Mastovska, D. J. Smith, X. Zhou, *Organizers*

**11:30 - 2:00**

Hydrolysis of amisulbrom in various pH buffer solutions: Kinetic and products identification. **j. hu**, K. Pang, H. Lin

Photodegradation of fluazaindolizine in aqueous solution under simulated sunlight illumination: Kinetic and mechanism study. **N. Pang**, H. Lin, j. hu

Application of kinetic models for degradation rate of triazole pesticides in perilla leaves. **H. Kim**, S. Lee, K. Se-Yeon, A. Sarker, H. Jeong, A. Nam, T. Kim, J. Kim

Structure determination of DNA adducts from chlorobenzonitrile pesticides. **M. Byron**, D.W. Boerth

Development of multi-residue analysis method of pesticides in organic agro-materials. **H. Jeong**, K. Se-Yeon, S. Lee, A. Sarker, H. Kim, A. Nam, J. Kim

Dissipation of fomesafen in fumigated and organic-amended soil in Florida tomato systems. **z. Li**, F. Di Gioia, J. Hwang, J. Hong, M. Ozores-Hampton, X. Zhao, C. Pisani, E. Rosskopf, P. Wilson

Method optimization for the trace analysis of planar pesticides in pigmented plant matrices. **E. Leonard**, C. Palmer, N. Tharayil

Section G

Placeholder

**Biological Considerations for Agrochemical Control**

Cosponsored by AGFD
C. B. Cleveland, *Organizer*

**11:30 - 2:00**

Alternative water source contaminant concerns for greenhouse agriculture. **J.C. Czarnecki**, T.M. Vadas, D. Kelemen, C. Kirchhoff, A. Tashev, R. Raudales

Semiochemicals for attraction of *Euwallacea* nr. *fornicatus*, a pest ambrosia beetle in southern Florida. **N. Tabanca**, P. Kendra, D. Owens, T. Narvaez, W. Montgomery, E. Schnell, D. Carrillo

Evaluation of repellents for *Euwallacea* nr. *fornicatus*, a pest ambrosia beetle in Florida avocado groves. P. Kendra, **N. Tabanca**, W. Montgomery, T. Narvaez, E. Schnell, A. Vazquez, D. Carrillo

Toxicity changes during photolysis of Triton X-100 in water. **E. Jho**, D.G. Yoo

Elucidating the influence of nanoparticle chemical and physical properties on their translocation and distribution in crop leaves. **P. Hu**, J. An, M. Faulkner, H. Wu, Z. Li, X. Tian, J. Giraldo

Acephate risk characterization. **W. Zhao**

Effect of polyethylene microplastics on strawberry plant growth, soil enzyme activity, and microbial community composition. **S. Chahal**, P. Wang, V. Bueno, H. Anand, S. Bayen, S. Ghoshal, V. Gravel, N. Tufenkji

Section G

Placeholder

**Biostimulants in Agriculture: Chemistry & Regulatory Aspects**

Cosponsored by BIOL, MEDI and TOXI
P. Halarnkar, M. E. Koivunen, K. D. Wing, *Organizers*

**11:30 - 2:00**

Foliar application of inositol-based biostimulant boosts zinc uptake and accumulation in wheat (*Triticum aestivum* L.). **D. Amaral**, P.H. Brown

Field methods for evaluating nutrient enhancement effects of biostimulants. **R.E. Ross**

Field screening approaches for monitoring whole-plant response modulated by biostimulants. **M. Park**, D. Amaral, P.H. Brown

Section G

Placeholder

**Development of Novel Vector Control Technologies**

Cosponsored by MEDI
A. D. Gross, E. J. Norris, D. Swale, *Organizers*

**11:30 - 2:00**

Phenalenones-based photosensitizers for mosquito control. **X. Shao**

Larvicide activity of biorational compounds to pyrethroid-resistance *Aedes aegypti* mosquitoes. **E. Johnson**, S. O'Neal, L. Rault, T.D. Anderson

Plant terpenoids as a source of novel nematicides. **C. Wong**, J.R. Coats

Combatting plant-parasitic nematodes with biorational pesticides. **J.S. Klimavicz**, J.O. Barizon, G.L. Tylka, J.R. Coats

Giving ticks 'dry mouth' through chemical modulation of inward rectifier potassium channels as a mechanism to prevent blood feeding. **Z. Li**, D. Swale

Inducing neural failure through chemical inhibition of insect inward rectifier potassium channels. **R. Chen**, D. Swale

Identification of novel target sites to reduce salivary gland function and feeding of *Aedes aegypti*. **A. Soohoo-Hui**, D. Swale

Toxicological relevance of potassium ion channels to honey bee immune health. **C.J. Fellows**, T.D. Anderson, D. Swale

Toxicological and neurophysiological characterization of natural product based chromene analogs to insect pests. **S. McComic**, D. Swale, K.M. Meepagala

Repurposing isoxazoline and diamide insecticides to control the sand fly, *Phlebotomous papatasi*. **M. Nguyen**, Z. Li, L. Foil, D. Swale

Developing an alternative method for deploying toxic sugar bait technologies. **C.L. Corona**, J.S. Klimavicz, J.R. Coats

Synergistic effects of potassium channel blockers and pyrethroids: Mosquitocidal activity and neuronal mode of action. **S. Jiang**, J.R. Bloomquist

Transcriptome analysis of the chicken mite *Dermanyssus gallinae* for the characterization of major acaricide target genes. K. Kim, S. Kim, J. Kim, **S. Lee**

Section G

Placeholder

**Ecological Considerations of Crop Protection**

Cosponsored by ENVR
C. B. Cleveland, *Organizer*

**11:30 - 2:00**

Growing good neighbors using technology to improve outreach and communication. **S. Regagnon**

Toxicology of a pyrethroid insecticide in the monarch butterfly and interactions with host plant defense chemicals. **A. Krueger**, T.D. Anderson

Some challenges of analytical method transfer for ecotoxicology study in CRO. **J. Wang**

Evaluation of DDT bioaccumulation in earthworms from a historically-contaminated orchard using Bayesian hierarchical modelling. **Z. Yang**, M.O. Anderson, T. LaChance, R.E. Plummer, D. Jackson, L.L. McConnell, C.J. Hapeman, A. Torrents

Placeholder

**Environmental Fate, Transport, & DRIFT Modeling of Agrichemicals**

Financially supported by Stone Environmental
S. Jackson, R. L. Warren, *Organizers*

**11:30 - 2:00**

Quantum yields and product studies for photolysis of neonicotinoids solid films. **W. Wang**, K.Z. Aregahegn, S.T. Andersen, A.Z. Ni, A. Rohrbacher, O. Nielsen, B.J. Finlayson Pitts

Atmospheric fate of neonicotinoids as pure compounds and in formulations. **A. Rohrbacher**, B.J. Finlayson Pitts

Ion-specific influences on the photodegradation of benzobicyclon hydrolysate in seawater. M. Knight, E.N. Vebrosky, **L. Basirico**, **K.L. Armbrust**

Common Issues in agrochemical risk communication. **D. Barrett**, M. Williams

Uptake, translocation, and metabolism of trace organic contaminants in water–plant. **J. Hwang**, P. Wilson

Evaluation of end points derived from soil rate of degradation studies dosed with cold and radio-labeled test substances and their impact on exposure assessment. **C. Fang**

Spray drift characterization using an ambient breeze tunnel. **T. Lane**, C. Mohler, F. Salzman, J. Arnold

Assessing lateral hydraulic connectivity of edge-of-field groundwater monitoring wells using a tiered modeling approach. **N. Kehrein**, W. He, F. Hegler, R. Sur

Higher tier fefinement on the tier 1 AgDRIFT buffer distance using REGDISP model for environmental risk assessment in New Zealand. **M. Kim**, M. Robert

Placeholder

**New Herbicides & Their Modes of Action & Design**

F. Dayan, S. O. Duke, T. M. Stevenson, *Organizers*

**11:30 - 2:00**

Highly functionalized herbicidal natural product: Synthesis, SAR and stereochemistry. **B. Kuhn**, H. Dietrich, D. Barber, U. Doeller, M. Hoffmann, D. Schmutzler, S. Schnatterer, M.E. Maier, T. Kocakaya, M. Morkunas

Computational modeling of inhibition of acetyl CoA carboxylase by cyclohexanedione and aryloxypropionic acid herbicides. **V. Sammeta**, D.W. Boerth

Complex nanoparticles for delivering crop protection agents. **j. zhang**

Section G

Placeholder

**Off-Target Transport of Field Applied Agricultural Chemicals: Study Designs, Monitoring, Modelling, & Risk Assessment**

Cosponsored by ENVR
S. Grant, A. M. Ritter, Q. Yao, *Organizers*

**11:30 - 2:00**

Establishment of soil management guideline for spinach cultivation in soils contaminated with endosulfan. **K. Se-Yeon**, S. Lee, A. Sarker, H. Kim, H. Jeong, A. Nam, J. Kim

Results of a multi-stakeholder workshop on incorporating the benefits of vegetative filter strips into aquatic risk assessment and risk management of

pesticides. D. Carley, Z. Tang, R. Munoz-Carpena, G. Fox, P.J. Rice, C. Truman, K.L. Armbrust, **L.L. McConnell**

Edge-of-field management to mitigate potential off-site pesticide movement. **M.A. Locke**, M. Moore, L. Yasarer, R. Bingner

Effectiveness of vegetated filter strips based on modeling with VFSMOD or fixed reduction percentages from the European regulatory framework. **R. Sur**, S. Reichenberger, H. Meyer, C. Kley

Regulatory implementation of VFS as a mitigation for transport of pesticides via runoff and erosion: European approach. **E. Henry**, B. Erzgräber, Z. Tang, R. Sur

Phytoremediation of atrazine using switchgrass (*Panicum virgatum*). **K. Hatch**, R. Lerch, K.W. Goyne, C. Willett, K.J. Robert, R. Craig

Section G

Placeholder

**Pollinators in Agroecosystems: Current Science Issues & Risk Assessment Approaches**

Cosponsored by ENVR
Financially supported by Intrinsik
C. Douglass, V. Kramer, A. Krueger, J. R. Purdy, T. Steeger, *Organizers*

**11:30 - 2:00**

Pollinator research task force: Overview of accomplishments and upcoming projects. **V.J. Kramer**

Residue analysis of cyantraniliprole and Its metabolites in bee products in support of ecotoxicology studies. **M.Y. Cabusas**

Sublethal effects of chlorantraniliprole exposure to a beneficial insect species. **J. Williams**, D. Swale, T.D. Anderson

Addressing multiple factors impacting honey bee colonies in large colony feeding studies with a mechanistic honey bee colony model. A. Schmolke, F. Abi-Akar, **D. Perkins**, N. Galic, S. Hinarejos

Contamination of bee-collected pollen in multiple landscapes. **J. Zawislak**, G. Lorenz, J. Adamczyk, N. Joshi

Toxicity of premixed insecticide chemistries to blue orchard bees. **J. Belsky**, N. Joshi

Section G

Placeholder

**Surfactant & Colloid Science Applied to Formulations**

Cosponsored by COLL
R. Acosta Amado, B. Rauzan, S. Sumulong, *Organizers*

**11:30 - 2:00**

Optimization of manufacturing process to improve the physical stability of oil-in-water emulsion agricultural formulation. **J. Xu**, R. Acosta Amado

Use of polar co-solvents to improve dilution properties at low temperature of high-load emulsifiable concentrate (EC) agrochemical formulations. **N. de Castro**, R. Acosta Amado

Overview of the application of surface chemistry in pesticide formulations. **V. Shing**

<section>

**Innovative Approaches to Enhancing Food Safety & Reducing Food Waste**

**Innovative approaches to enhancing food safety and reducing food waste**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Chemistry & Applications of Free Radical-based Technologies for Water Treatment & Purification**

**Sulfate radicals- and electrochemical production of radicals-based technologies**

Sponsored by ENVR, Cosponsored by AGRO

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**Biochar & Hydrochar for Energy, Environmental & Agricultural Applications**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Proposition 65 on Food Safety**

**Proposition 65 on Food**

Sponsored by AGFD, Cosponsored by AGRO

**WEDNESDAY AFTERNOON**

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

**Innovative Approaches to Managing the Interface Between Pesticide Use & Non-Target Species Habitat Protection**

Cosponsored by ENVR
A. Beehler, A. Frank, L. Moreno, *Organizers, Presiding*
K. Bissell, *Presiding*

**2:00** Introductory Remarks.

**2:05** Ontogeny of a pesticide application with respect to FIFRA/ESA endangered species risk interpretation. **B. McGaughey**

**2:30** Conservation measures and their role in the endangered species act consultation process. **K. Bissell**, L. Laniawe

**2:55** Tools developed to inform landowners about sensitive habitats and conservation options. **J. Peters**, **M. Crowder**, **A. Rivers**

**3:20** Ensuring safety of sensitive listed plants to new crop protection products. **D.E. Edwards**, P.J. Rice, S.R. Mortensen

**3:45** Intermission.

**4:05** What do we actually do? Review of modern integrated mosquito control programs in the United States. **G. White**

**4:30** Best management practices: Using species specific technology to control *Aedes aegypti* mosquitoes at Anastasia Mosquito Control District. **R. Xue**

**4:55** Quantitative analysis of traditional and non-traditional techniques to minimize spray drift. **J. Bonds**

**5:20** Endangered Species Act considerations in planning and implementing pesticide use. **C.A. Roberts**

**5:45** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**Plant-Insect-Microbe Communications in Agriculture: General Session**

Cosponsored by AGFD
P. Kendra, J. Niogret, N. Tabanca, *Organizers, Presiding*

**2:00** Introductory Remarks.

**2:05** Role of semiochemicals in plant-insect-entomopathogenic nematode interactions. **H.T. Alborn**

**2:30** Constitutive, herbivore- and microbe-induced *Citrus jambhiri* (lemon) volatiles differentially influence African citrus triozid *Trioza erytreae* behavior. **B. Torto**, A.K. Antwi-Agyakwa, S.A. Mohamed

**2:55** Exploring the role of phenolic and terpenoid compounds in grapevine defense against pathogens and insects. **C.M. Wallis**

**3:20** Interaction of ants and microbes with special emphasis on the fire ant, *Solenopsis invicta*. **R.K. Vander Meer**

**3:45** Intermission.

**4:05** Developing microbial odor based repellents to manage spotted wing drosophila, *Drosophila suzukii*. **D. Cha**, G. Loeb

**4:30** Development of infestation detection and population monitoring tool for invasive species, spotted wing Drosophila. **A. zhang**, Y. Feng, N. Larson

**4:55** Agricultural screening of volatile organic compounds as indicators of infestation by portable gas chromatography. **L.D. Mosser**

**5:20** Nectar microbe mixtures differ from single species in volatile emission and pollinator acceptance. **C.C. Rering**, R.L. Vannette, R. Schaeffer, J.J. Beck

**5:45** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**Transfer of Analytical Methods: The Good, the Bad, & the Ugly**

R. M. Bennett, K. Clark, J. E. Foster, L. Riter, *Organizers, Presiding*

**2:00** Introductory Remarks.

**2:05** Transferring a verified method for the analysis of pesticides in cannabis to contract laboratories: Lessons learned. **P.C. Winkler**, D. Tran, R. DiLorenzo, S. Roberts, C. Butt, K. Oetjen, K. Hyland, C. Borton

**2:30** Transfer of a trace level dicamba method between industry and a state agency to enable assessment of off-target transport. **A. Meredith**, M. Green, J. Toler, P. Jensen, L. Riter, A. Chen, D.L. Sparks, A.E. Brown

**2:55** Methods of miscommunication: Series of unfortunate events. **E.A. Schoenau**, **T.F. Moate**

**3:20** Challenges for developing a method, validation and method transfer. **R.M. Bennett**

**3:45** Intermission.

**4:05** LC-MS/MS analysis of neonicotinoids and their metabolites in different environmental matrices by modified QuEChERS. **M.J. Hall**, V. Dang, D.J. Borts, S.P. Bradbury, J.R. Coats

**4:30** Obstacle course of running SANCO compliant method validations to support ecotoxicology studies. **L. Zhang**, K. Martin

**4:55** Discussion.

**5:10** Concluding Remarks.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**Environmental fate, transport, & modeling of agriculturally-related chemicals**

Financially supported by Stone Environmental
S. Jackson, R. L. Warren, *Organizers, Presiding*

**2:25** Introductory Remarks.

**2:30** Pesticide quantitative structure-biodegradability relationship models. **D. Tomandl**, D. Cirovic, M. Hastings, K. Lynn, S. Gehen, R. Rasoulpour

**2:55** US EPA CompTox Chemicals Dashboard providing access to experimental and predicted environmental fate and transport data. **A.J. Williams**, C. Grulke, K. Mansouri, T. Martin

**3:20** Improved lipophilicity (clogD) QSAR models for agrochemicals. **Y. Djoumbou Feunang**, D. Tomandl

**3:45** Intermission.

**4:05** Refinement of consumer use pesticides application practices and resulting improvements to exposure predictions in ecological risk assessments. **S. Castro-Tanzi**, L. Padilla, W. Hillwalker, M. Winchell

**4:30** Screening for regions vulnerable to runoff in Brazil: Case study using the exposure model PRZM. **N. Kehrein**, H. Lißner

**4:55** Spatially explicit modeling of static, flowing, and intermittent water bodies in probabilistic pesticide exposure assessments. **M. Winchell**, H. Rathjens, P. Whatling

**5:20** Discussion.

**5:45** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Development of Novel Vector Control Technologies**

Cosponsored by MEDI
A. D. Gross, E. J. Norris, D. Swale, *Organizers, Presiding*

**2:00** Introductory Remarks.

**2:05** Potential of spatial repellents for the control of mosquito-borne disease. **N.L. Achee**

**2:30** Challenges in developing new vector control tools. **R. Koganemaru**, K. Ohashi, N. Sakamoto

**2:55** Avoiding silent spring: Revolutionizing vector control by redesigning insecticide discovery and delivery. S. Shruti, M. Murgia, J. Kaur, J. Scott, W. Austin, S. Nakatake, D. Flaherty, M. Scharf, L. Raymond, L. Pfeiffer, V. Watts, **C.A. Hill**

**3:20** Using semiochemicals to control disease vectors. **A. Mafra Neto**

**3:45** Intermission.

**4:05** Investigations for reducing fitness in peridomestic mosquitoes using spatial repellents. **C.S. Bibbs**, J.R. Bloomquist, D.A. Hahn, P.E. Kaufman, R. Xue

**4:30** Solid-state form dependent lethality of fast-acting fluoro analogs of the contact insecticide DDT. **X. Zhu**, M.D. Ward, B.E. Kahr

**4:55** Structure-activity relationship analysis of potential new insecticides and repellents. **G. Richoux**, Q. Coquerel, F. Démares, L. Yang, K. Linthicum, J.R. Bloomquist

**5:20** Concluding Remarks.

<section>

**Innovative Approaches to Enhancing Food Safety & Reducing Food Waste**

**Innovative approaches to enhancing food safety and reducing food waste**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Chemistry & Applications of Free Radical-based Technologies for Water Treatment & Purification**

**Novel materials application for free radicals-based technologies**

Sponsored by ENVR, Cosponsored by AGRO

<section>

**Edible Functional Food Packaging from Agricultural Biomacromolecules**

**Edible functional food packaging from agricultural biomacromolecules**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Proposition 65 on Food Safety**

**Proposition 65 on Food**

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<section>

**Biochar & Hydrochar for Energy, Environmental & Agricultural Applications**

Sponsored by ENVR, Cosponsored by AGRO

## THURSDAY MORNING

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

**Advances in Spray Drift Deposition Characterization & Measurement**

Cosponsored by ENVR
G. Goodwin, G. Kruger, J. W. Perine, D. Perkins, *Organizers, Presiding*

**8:15** Introductory remarks.

**8:20** Standardizing methods of spray drift measurement. **J. Bonds**, A.C. Chappel, N. Mackay

**8:45** Drift of droplets from air induction nozzles. **S. Post**

**9:10** Assessment of spray drift and resulting plant effects in a non-target plant field study. **D. Moore**, C. Banman, B. Brayden, A.C. Chappel, T. Hall, J.P. Hanzas, R. Isemer, L. Ortego, I.M. Rodea Palomares, S. Rodney, Z. Tang, K. Watson, T. Xu, Y. Yang

**9:35** Remote-sensing based assessment of long-term riparian vegetation health in proximity to agricultural lands with herbicide use history. **L. Ghebremichael**, F. Yousef, J.W. Perine, M. Gebremichael

**10:00** Intermission.

**10:20** Drift potential from glyphosate and 2,4-D applications as influenced by nozzle type and adjuvants. **G. Sousa Alves**, B.C. Vieira, T.R. Butts, S.M. Silva, J. Cunha, G. Kruger

**10:45** Effect of adjuvants on dicamba droplet size and physicochemical properties of the solution. **G. de Castro Macedo**, G. Obear, F. Sexton, J.A. Golus, J. Gizotti-de-Moraes, G. Kruger

**11:10** Characterizing worker exposure to pesticides without personal monitors: Developing challenge for all pesticides. R.D. Sullivan, **D.A. Sullivan**

**11:35** Application of FTIR spectroscopy and chemometrics for the classification of auxin herbicides in damaged cotton and soybean tissue. **A.E. Brown**, J. Buol, C.X. Reid, D. Reynolds, B. Blackburn, D.L. Sparks, K. Greg

**12:00** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**Plant-Insect-Microbe Communications in Agriculture: General Session**

Cosponsored by AGFD
P. Kendra, J. Niogret, N. Tabanca, *Organizers, Presiding*

**8:15** Introductory Remarks.

**8:20** Phytochemicals are key drivers of host and range expanding insect herbivores. **N. Erbilgin**

**8:45** Controlling fusarium dieback: Shot hole borers throughout avocado groves in california. S.C. Lynch, R. Stouthamer, G.S. Gilbert, **A. Eskalen**

**9:10** Stink bug pheromones of bisabolane structural motif: identification, synthesis, and use in pest management. **A. Khrimian**, M. Blassioli Moraes, M. Borges, R. Laumann, E. Hickel, D.C. Weber

**9:35** Pheromonal regulation of reproduction in a plant bug. **C.S. Brent**

**10:00** Intermission.

**10:20** Tracking female moths (*Lepidoptera*: *Tortricidae*) in orchards with new kairomonal blends. **A.L. Knight**

**10:45** Traps and attractants for monitoring for *Amyelois transitella* in the presence of mating disruption. **C.S. Burks**, J.J. Beck, B. Higbee

**11:10** Identification of novel host plant volatiles for use as navel orangeworm attractants. N. Mahoney, W. Gee, B. Reynolds, **L.W. Cheng**

**11:35** Advances in the synthesis, design, and formulation of semiochemicals used to control tephritid fruit flies (*Diptera: Tephritidae*). **D. Kuzmich**, S.S. Walse

**12:00** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**Interpreting, Communicating & Managing Risk in the FIFRA/ESA Regulatory Setting**

J. Rodgers, G. Watson, *Organizers*
B. McGaughey, *Organizer, Presiding*
G. Bahr, N. Golden, *Presiding*

**8:15** Introductory Remarks.

**8:20** Informing national-level assessments with FESTF's "gopher" data integration tool. **A. Frank**, T. Hall, D.D. Campbell

**8:45** Mitigating risk with technology communication tools. **S. Regagnon**

**9:10** Pesticide use in the Pacific Northwest: Enabling compliance with the Endangered Species Act. **J.J. Jenkins**, P.K. Janney

**9:35** Making the intersection of FIFRA and ESA work!. **M. Dobbs**, T. Hall

**10:00** Intermission.

**10:20** Participating in the registration review and Endangered Species Act processes for the protection of endangered species. **L.A. Moreno-Matiella**, C. Bilheimer

**10:45** Lesson for agriculture: when the Endangered Species Act interferes with management of an invasive species. **G. Watson**

**11:10** Leveraging national compensatory mitigation conservation offset strategies to proactively address endangered species section 7 authorized take of residual, unavoidable impacts permitted within national scale pesticide biological opinions. **W. White**, J. Bickel, N.J. Snyder

**11:35** Investigating the adoption of conservation activities by agricultural stakeholders. **L. Duzy**

**12:00** Concluding Remarks.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**To GLP or Not? How-To's for the AGRO Professional**

Financially supported by SQA
C. Lee, J. Mazlo, *Organizers*
K. Watson, *Organizer, Presiding*

V. Erickson, *Presiding*

**8:15** Introductory Remarks.

**8:20** To GLP or not to GLP: That is the question. **K. Watson**

**8:45** Good documentation practices, data quality, and data integrity. **J. FRANCHETTI**

**9:10** Digital data documentation: Good documentation practices for electronic data for EPA GLP studies when electronic laboratory notebook is used to record study data. **L. Hayes**

**9:35** Management of multisite studies: Challenges and solutions. **L.U. Sanghani**

**10:00** Intermission.

**10:20** Interactions between the study director and quality assurance experts on GLP agricultural field studies: Challenges and bright spots. **A.M. Moore**, J. Mazlo

**10:45** Failure to comply: How does this happen?. **V. Erickson**

**11:10** EPA good laboratory practice compliance. **F. Liem**, D. Myers, M. Lehr

**11:35** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Development of Novel Vector Control Technologies**

Cosponsored by MEDI
A. D. Gross, E. J. Norris, D. Swale, *Organizers, Presiding*

**8:40** Introductory Remarks.

**8:45** Natural and biorational repellents to protect against disease vectors. **J.R. Coats**, J.S. Klimavicz, C.L. Corona, C. Wong, E.J. Norris

**9:10** Improvements to biorational mosquito repellents: Beyond simple monoterpenoid esters. **J.S. Klimavicz**, C.L. Corona, J.R. Coats

**9:35** Natural and synthetic compounds display multiple mechanisms of synergism and resistance-breaking properties. **E.J. Norris**, J.R. Bloomquist

**10:00** Intermission.

**10:20** Use of volcanic rock to kill mosquitoes and other vector important arthropods. **R.M. Roe**, J. Deguenon, R. Mitchell, A. Dhammi, C. Apperson, J. Strider, J. Zhu, G. Cave, M. McCord, D. Stewart, F. Agossa, R. Azondekon, J. Ahoga, B. N'dombidje, R. Anagonou, G. Padonou, M. Akogbeto, K. Chen

**10:45** Liriodenine, a natural plant alkaloid, as a tool to explore new targets for mosquitocidal activity. **Q.R. Coquerel**, F. Démares, A. Le Ray, C. Legros, J.R. Bloomquist

**11:10** Vapor delivery of plant essential oils alters pyrethroid efficacy and detoxification enzyme activity in mosquitoes. **S. O'Neal**, E.J. Johnson, L. Rault, T.D. Anderson

**11:35** Insecticidal activity of essential oil-derived compounds and their possible synergy mechanisms in the yellow fever mosquito, *Aedes aegypti*. **J. Tak**, J.R. Bloomquist

**12:00** Concluding Remarks.

<section>

**Innovative Approaches to Enhancing Food Safety & Reducing Food Waste**

**Innovative approaches to enhancing food safety and reducing food waste**

Sponsored by AGFD, Cosponsored by AGRO

<section>

**Edible Functional Food Packaging from Agricultural Biomacromolecules**

**Edible functional food packaging from agricultural biomacromolecules**

Sponsored by AGFD, Cosponsored by AGRO

## THURSDAY AFTERNOON

Section A

San Diego Convention Center
Ballroom 20CD Theater 1

**Unmanned Aerial Vehicles (aka Drones): Pesticide Spraying & other Agricultural Applications**

Cosponsored by ENVR
A. Jacobson, *Organizer*
J. W. Perine, *Organizer, Presiding*

**1:15** Introductory Remarks.

**1:20** Implementation of sUAVs into public health vector control programs. **E.S. Horvath**, **D.M. Smith**

**1:45** Spray drift from drone application. **T. Lane**, C. Scott, F. Salzman, J. Arnold

**2:10** Precision pesticide applications with remotely-piloted aerial spray systems (RASS) in a steep vineyard setting. **J. Bonds**, A. Herbst, C. Wang, X. He

**2:35** Best management practices (BMP) for unmanned aerial vehicle (UAV) applications to improve rice pest control in China with FMC's Rynaxypyr® products. **X. Li**, J. Andaloro, E.B. Lang

**3:00** Unmanned aerial spraying of pesticides in Brazil: Regulation and expectations. **L. Souza**, M. Ceccon

**3:25** Panel discussion.

**3:45** Concluding Remarks.

Section B

San Diego Convention Center
Ballroom 20CD Theater 2

**Formulating Complex Agrochemical Mixtures**

R. Acosta Amado, B. Rauzan, J. Whitteck, *Organizers*
J. Whitteck, *Presiding*

**1:15** Introductory Remarks.

**1:20** Metribuzin crystal growth inhibition in a premixture formulation: Fierce® MTZ herbicide. **J. Tanuwidjaja**, S. Cheung

**1:45** Layered formulating to improve stability of seed treatment blends. **R.F. Colletti**, M. Migliazzo, S. Selness, D.J. Seyer

**2:10** Finally: An application designed to meet the research needs of formulators. **M.A. Strausbaugh**, M.A. Pozenel

**2:35** Addressing physical stability of complex suspension formulations. **j. zhang**, G.J. Klopf

**3:00** *Escherichia coli* inactivation during biosolarization using tomato and grape pomaces as soil amendments. **J. toniato**, E. Shea, C.W. Simmons

**3:25** Discussion.

**3:35** Concluding Remarks.

Section C

San Diego Convention Center
Ballroom 20CD Theater 3

**High Throughput Approaches to Support Pesticide Discovery & Development**

K. Lynn, M. Zhang, *Organizers*
L. Riter, *Organizer, Presiding*

M. Ma, *Presiding*

**1:15** Introductory Remarks.

**1:20** Finding novel lead compounds in pesticide discovery inspired by pharmaceutical research. **F. van den Broek**, **M. Shkrob**, A. Yuryev

**1:45** High throughput environmental fate and metabolism assays to support pesticide discovery & development. **M. Ma**, V. Badwaik, K. Lynn, P. Yu, M. Huang, Y. Adelfinskaya, M. Hastings, A. Eatherall, S. Gehen, G. Shan

**2:10** High-throughput experimental and computational technologies at the National Center for Computational Toxicology. **A.J. Williams**, J. Wambaugh, K. Houck, R. Judson, K. Paul-Friedman

**2:35** Sorption of pesticides in soil: Screen data, QSAR, and prediction. **X. Huang**, M. Ma, P. Yu, A. Eatherall

**3:00** Development of optimized extraction and pass-through SPE cleanup protocols for LC-MS and GC-MS multiresidue pesticide and veterinary drug analysis. **M.S. Young**, M. Blaze, k. tran

**3:25** Concluding Remarks.

Section D

San Diego Convention Center
Ballroom 20CD Theater 4

**Novel Applications of Mathematics, Statistics, & Modeling to Agrochemical Problems**

J. R. Purdy, K. Schnelle, *Organizers*
W. Al-Akhdar, W. Chen, *Organizers, Presiding*
J. Purdy, *Presiding*

**1:15** Introductory Remarks.

**1:20** In silicon investigation on agrochemical toxicities against aquatic organism: QSTR models on *Daphnia Magna*. **J. Cheng**, L. He, **Z. Xu**, **Z. Li**

**1:45** Relating environmental parameters to dicamba emissions under humidome conditions. **T.C. Mueller**, L.E. Steckel

**2:10** Mechanistic modeling the breakup of liquid sheets of agricultural spray. **N. Rajan**, S. Cryer

**2:35** Pooled data approach for percentile estimates of pesticide surface water monitoring data. **P. Mosquin**, J. Aldworth, W. Chen

**3:00** Exposition of the SEAWAVE-QEX model and other developments for the modeling of surface-water concentration monitoring data. **J. Aldworth**, P. Mosquin, W. Chen

**3:25** Mathematics chemistry and toxicology in the design of pesticide monitoring programs for surface water. **J.R. Purdy**, S. Purdy

**3:50** Concluding Remarks.

Section E

San Diego Convention Center
Ballroom 20CD Theater 5

**Legal Challenges & Landmark Lawsuits in Agrochemicals**

Cosponsored by CHAL
J. Van Emon, *Organizer*
R. M. Bennett, A. Coates, *Organizers, Presiding*
J. M. Van Emon, *Presiding*

**1:00** Introductory Remarks.

**1:05** What next for the chemist? Regulation in a changing legal environment. **R.M. Bennett**

**1:30** Taste of water. **A. Ehrlich**

**1:55** NAICC advocating for crop and research consultants. **D. Hattermann**

**2:20** How the US Constitution impacts agriculture. **A. Coates**

**2:45** New agrochemical products: Clearing a path for commercialization. **J.L. Krieger**

**3:10** Appealing from patent examiner's rejections to USPTO's patent, trial and appeal board (PTAB) can improve the chances of obtaining patents on agricultural products. **X. Pillai**

**3:35** Panel Discussion.